What is claimed:

1. An electrofusion microelectrode for manipulating cells or cellular components which comprises a conducting filament encased in a tube, wherein a first (medial) end of the filament protrudes from, and is flattened against, a first (medial) end of the tube, and wherein a second (distal) end of the filament protrudes from a second (distal) end of the tube and wherein the second (distal) end of the filament is configured to allow the filament to remain relatively fixed within the tube and to allow connection to a direct current power source.

2. An electrofusion microelectrode which comprises a tube, wherein at least a portion of the inner walls are painted with a liquid electric conductor and wherein the painted electric conductor extends continually from a first (medial) end of the tube to a second (distal) end of the tube, wherein the liquid electric conductor is further painted on a least a portion of the outer (lateral) edge of both the first (medial) and second (distal) ends of the tube, wherein an area on the outer wall of the tube at the second (distal) end is painted with the electric conductor and wherein the painted area of the outer wall of the tube at the second (distal) end meets the painted area of the outer (lateral) edge of the second (distal) end of the tube, and wherein the distal end of the tube is connectable to a direct current power source.

3. An electrofusion microelectrode which comprises a conducting filament encased in a tube, wherein a first (medial) end of the filament extends toward a first (medial) end of the tube, and wherein a second (distal) end of the conducting filament protrudes from a second (distal) end of the tube, wherein at least a portion of the inner walls near the first (medial) end of the tube is painted with an electric conductor in an area where the conducting filament does not extend, and wherein the second (distal) end of the conducting filament is configured to allow the filament to remain fixed within the tube and to allow connection to a direct current power source.

4. The electrofusion microelectrode of any of claims 1-3 wherein the tube is shaped as a holding pipette.

5. The electrofusion microelectrode of any of claims 1-3 wherein the first (medial) end of the tube is sealed.

6. The electrofusion microelectrode of any of claims 1-3 wherein the first (medial) end of the tube is open.

7. The electrofusion microelectrode of any of claims 1-3 wherein the tube is made of plastic, PVC, ceramic, or metal.

8. The electrofusion microelectrode of any of claims 1-3 wherein the tube is made of glass.

9. The electrofusion microelectrode of claims 1 or 3 wherein the conducting filament is made of a metal, metal alloy, or mixture of metals.

10. The electrofusion microelectrode of claim 9 wherein the metal or metal alloy is at least one of aluminum, copper, silver, gold, titanium, platinum, or tungsten.

11. The electrofusion microelectrode of any of claims 1-3 wherein the second (distal) end of the tube is connectable to a vacuum or hand held aspirator.

12. The electrofusion microelectrode of claim 11 wherein the hand held aspirator is a pipette holder.

13. The electrofusion microelectrode of any of claims 1-3 wherein the electrofusion microelectrode is mounted on a tool holder.

14. The electrofusion microelectrode of claim 13 wherein the tool holder is controlled by a micromanipulator.

15. The electrofusion microelectrode of claim 14 wherein the micromanipulator is used under inverted microscopy.

16. The electrofusion microelectrode of claims 1 or 3, wherein the second (distal) end of the conducting filament is configured by being bent or

looped towards the outer wall of the tube or being wrapped around the outer wall of the tube.

17. A method of transplanting mammalian cells which comprises micromanipulating the cells with two electrofusion microelectrodes and delivering a direct current to the manipulated cells wherein the electrofusion microelectrodes comprise the electrofusion microelectrode of any one of claims 1-3.

18. A method of electrofusion of cells which comprises aligning cells between two electrofusion microelectrodes and delivering a direct current to the aligned cells, wherein the electrofusion microelectrodes comprise the electrofusion microelectrode of any one of claims 1-3.

19. A method of electroporation of cells which comprises manipulating cells with two electrofusion microelectrodes and delivering a direct current to the manipulated cells, wherein the electrofusion microelectrodes comprises the electrofusion microelectrode of any one of claims 1-3.

20. A method of nuclear transplantation which comprises removing a nucleus from a first oocyte and transplanting the nucleus into the perivitelline space of a second, previously enucleated oocyte, integrating the transplanted nucleus of the first oocyte with the cytoplasm of the second oocyte, wherein the transplantation and integration is performed using two electrofusion microelectrodes, wherein the integration is performed by delivering a direct current to the nucleus and cytoplasm, and wherein the electrofusion microelectrodes comprise the electrofusion microelectrode of any one of claims 1 - 3.